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(c) 2002 Cambridge Sci Abs

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(c) 2002 INIST/CNRS

File 238:Abs. in New Tech & Eng. 1981-2002/Jul
(c) 2002 Cambridge Sci Abs

File 292:GEOBASE(TM) 1980-2002/Aug
(c) 2002 Elsevier Science Ltd.

File 293:Eng Materials Abs(R) 1986-2002/Sep
(c) 2002 Cambridge Scientific Abs

File 323:RAPRA Rubber & Plastics 1972-2002/Sep
(c) 2002 RAPRA Technology Ltd

File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
(c) 1998 Inst for Sci Info

Set	Items	Description
S1	837955	ROAD OR ROADS OR STREET OR STREETS OR BRIDGE? OR ROADWAY? - OR DRIVEWAY? OR DRIVE()WAY? ?
S2	8391	RESURFAC? OR REFINISH? OR RE() (SURFAC? OR FINISH?)
S3	518119	ROCKS OR STONES OR ROCKCHIP? OR ROCK(2N)CHIP? ?
S4	73390	BLOWER? OR BLOWING OR AIRBLOWER?
S5	98309	BROADCAST?
S6	0	S1(S)S2(S)S3(S)S4
S7	9	S1(S)S3(S)S4
S8	9	RD (unique items)
S9	0	S3(10N)S4(10N)S2
S10	110519	SHOOT?
S11	56	(S4 OR S10) (7N)S3
S12	9	S4(7N)S3

8/3,K/1 (Item 1 from file: 63)
DIALOG(R)File 63:Transport Res(TRIS)
(c) fmt only 2002 Dialog Corp. All rts. reserv.

00743039 DA
**TITLE: THE EASY *ROAD* TO SMA: NEW FIBRE-*BLOWING* PLANT PROVIDES KEY
BENEFITS FOR NASH *ROCKS***
CORPORATE SOURCE: QUARRY MANAGERS' JOURNAL LTD, 7 REGENT STREET, NOTTINGHAM
, NG1 5BS , UNITED KINGDOM
JOURNAL: QUARRY MANAGEMENT Pag: P39
PUBLICATION DATE: 19970800 PUBLICATION YEAR: 1997
LANGUAGE: ENGLISH SUBFILE: IRRD (I)
IRRD DOCUMENT NUMBER: 893164
ISSN: 0305-9421
DATA SOURCE: Transport Research Laboratory (TRL)

**TITLE: THE EASY *ROAD* TO SMA: NEW FIBRE-*BLOWING* PLANT PROVIDES KEY
BENEFITS FOR NASH *ROCKS***

8/3,K/2 (Item 1 from file: 81)
DIALOG(R)File 81:MIRA - Motor Industry Research
(c) 2002 MIRA Ltd. All rts. reserv.

155602
GM technology showcased at Baja 2000
General Motors - Press Release
October 25, 2000

Document Type: PRESS RELEASE Language: ENGLISH
Record Type: ABSTRACT
Supplier Record Type: Press Release

...miles during the nighttimes hours utilizing Night Vision.

According to Brian Miller, GM Racing off-*road* truck program manager,
Night Vision will enhance their drivers' ability to detect a potentially
dangerous...

...topography of the racecourse. Depending on conditions, Night Vision
allows drivers to see down the *road* up to three to five times farther
than standard headlamps as well as during unfavourable weather conditions
such as fog, heavy rain and wind storms that create *blowing* dirt or
hanging dust. Although the race-prepared Chevy TrailBlazers competing in
the Baja 2000 utilize additional driving lights, sometimes objects in the
off-*road* racing environment are not distinguishable, such as *rocks*,
bushes or even animals. Night Vision will provide the additional
information the driver requires during...

8/3,K/3 (Item 1 from file: 103)
DIALOG(R)File 103:Energy SciTec
(c) 2002 Contains copyrighted material. All rts. reserv.

03252688 CLA-92-010200; EDB-92-015445
Title: Peculiarities of locomotive haulage using combined locomotives
Original Title: Osobennosti organizatsii lokomotivnoi otkatki s
ispol'zovaniem kombinirovannykh ehlektrovozov
Author(s): Stepanenko, V.P.
**Title: Mining machinery, mine transport technical maintenance and repair of
mining equipment**
Original Title: Gornaya mekhanika, rudnichiyi transport, tekhnicheskoe

obslužhivanie i remont GSbO
Original Series Title: Nauchnye Soobshcheniya, Institut Gornogo Dela imeni
A.A. Skochinskogo
Publisher: Moscow Institut Gornogo Dela imeni A.A. Skochinskogo
ISSN: 0540-939X
Publication Date: 1988
p 123-130 (192 p)
Language: In Russian

...Abstract: are evaluated. The following factors are considered: output of
a mine haulage system, type of *roadway* in which locomotives are used,
ventilation type (fresh air, used air or independent ventilation with a
local *blower*), level of methane hazards, level of rock burst hazard.
A method for calculating output of locomotive haulage for coal, mine
stones, materials and for manriding is discussed.

8/3,K/4 (Item 2 from file: 103)
DIALOG(R)File 103:Energy SciTec
(c) 2002 Contains copyrighted material. All rts. reserv.

02018210 EDB-87-146164
Title: Mine roadways and chambers driven in the Morcinek mine by the Mining
Operations Plant in Jastrzebie
Author(s): Okoniewski, M.; Lincner, M.
Source: Proj.-Probl. Budown. Wegl. (Poland) v 31:11/12. Coden: PPBWE
Publication Date: Nov 1986
p 25-31
Language: Polish

...Abstract: phase of mine drivage when capital workings and chambers at
shaft bottom were driven, mine *stones* were hoisted by buckets used
also for shaft excavation. Mine *roadways* were driven by drilling and
blasting using WWS-12ap and WUP-22 drilling equipment, loaders...

...Local ventilation systems with air pipes 900 mm and 1,000 mm in diameter
and *blowers* were used. The GUC 250 P air conditioning system was used
at the 950 m...

8/3,K/5 (Item 3 from file: 103)
DIALOG(R)File 103:Energy SciTec
(c) 2002 Contains copyrighted material. All rts. reserv.

01893168 CLA-87-000830; EDB-87-020812
Title: Use of chemical compositions
Author(s): Vasil'ev, V.V.; Chechel'nitskii, B.I.; Surzher, V.Kh.
Affiliation: IGD im. A.A. Skochinskogo (USSR)
Source: Bezop. Tr. Prom-sti. (USSR) v 3. Coden: BZTPA
Publication Date: Mar 1986
p 27-30
Language: Russian

...Abstract: concrete. Glass reinforced plastic has been used to produce
roof beams, parts for portable supports, *roadway* lagging, anchor
bolts, drainage pipes, axial *blower* blades, etc. Polymers are used to
give increased wear resistance in such items as conveyor...

...are used in water curtain equipment. Polyurethanes and synthetic resins
are used to reinforce weak *rocks*; this has led to a 20% improvement
in labor productivity in one Dobropol'eugol' mine...

8/3,K/6 (Item 4 from file: 103)
DIALOG(R)File 103:Energy SciTec
(c) 2002 Contains copyrighted material. All rts. reserv.

01706673 DE-86-001366; EDB-86-030340
Title: Analysis of heat conditions in a working during mine driveage
Author(s): Galkin, A.F.
Title: 4th IBMT session - papers. Vol. I
Conference Title: 4. session of the International Bureau of Mining
Thermophysics
Conference Location: Bretby, UK Conference Date: 14 May 1985
Publisher: International Bureau for Mine Thermophysics, Warsaw, Poland
Publication Date: 1985
p 11, Paper 1/13
Report Number(s): CONF-8505210-
Language: Russian

...Abstract: mathematical model (a variant of Jordan's model) for
predicting temperature distribution in a mine *roadway* driven in
permafrost strata under conditions of *blowing* or exhaust ventilation.
Heat exchange between surrounding rock strata and the air used for
ventilation, between mine *stones* handled at a working face and the
air, as well as between the machines used...

...strata control and support installation are derived. Methods for
selecting the optimum capacity of a *blower* used for local ventilation
in mine driveage are discussed. (8 refs.) ...

8/3,K/7 (Item 5 from file: 103)
DIALOG(R)File 103:Energy SciTec
(c) 2002 Contains copyrighted material. All rts. reserv.

01559313 EDB-85-066087
**Title: Increasing stability of mine workings under complicated mining and
geologic conditions**
Author(s): Pin'kovskii, G.S.
Source: Ugol' (USSR) v 7. Coden: UGOLA
Publication Date: Jul 1984
p 24-29
Language: Russian

Abstract: Methods are discussed for strata control in mine *roadways*
driven under complicated mining and geologic conditions in the Western
Donbass (geologic faults, high water influx, weak *rocks* surrounding
mine *roadways*, intensive floor heave, methane *blowers*, rock
bursts). Types of yielding arched steel supports with increased yield
strength and improved design of joints used in mine *roadways* with
hazards of floor heave are evaluated. Support design is shown in 5
schemes. Effects...

...maintenance and repair of support systems. The use of hardening stowing
for protection of mine *roadways* is discussed.

8/3,K/8 (Item 6 from file: 103)
DIALOG(R)File 103:Energy SciTec
(c) 2002 Contains copyrighted material. All rts. reserv.

01363158 EDB-84-060840
Title: Climatic conditions and ventilation in coal mines without gas

emission

Author(s): Frolov, M.A.; Potaturin, A.Ya.
 Source: Ugol' Ukr. (Ukrainian SSR) v 5. Coden: UGOUA
 Publication Date: May 1983
 p 33-34
 Language: Russian

...Abstract: and air velocity were not observed. Air temperature increase was caused by heat transfer from *rocks* to the air (from 45 to 65%) and by machines and equipment (from 15 to...

...the average air losses amounted to 65.6% of the capacity of the main mine *blowers*. Air losses were the highest in mines with main *blowers* located at the mouth of skip shafts. In this case air losses ranged from 40...

...workings of anthracite mines three zones of air losses were comparatively evaluated: from main mine *blowers* to the major haulage *roadway*, from the major haulage *roadway* to inclined *roadways* in mine sections and at working faces. In the first zone air losses ranged from...

8/3,K/9 (Item 7 from file: 103)

DIALOG(R)File 103:Energy SciTec
 (c) 2002 Contains copyrighted material. All rts. reserv.

01112689 EDB-83-012691

Title: Operation of a working face according to a technological scheme using the 20 KP system

Author(s): Sarbash, V.G.; Khalangot, G.V.
 (USSR)
 Source: Ugol' Ukr. (Ukrainian SSR) v 3. Coden: UGOUA
 Publication Date: Mar 1982
 p 19-20
 Language: English

...Abstract: Methane content ranges from 5.8 to 25.8 m/sup 3//t, temperature of *rocks* surrounding the coal seam amounts to 29 C. The coal seam at a mining depth...

...is prone to coal dust explosions, spontaneous combustion and methane emission in the form of *blowers*. Long coal pillars (blocks) are mined according to a retreating scheme. The face is mined...

...system is satisfactory. The original supports for joints of the working face and both gate *roads* guarantee safety and prevent rock falls. The average coal output from the face amounts to...

?

8/7/1 (Item 1 from file: 63)
DIALOG(R)File 63:Transport Res(TRIS)
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00743039 DA

**TITLE: THE EASY *ROAD* TO SMA: NEW FIBRE-*BLOWING* PLANT PROVIDES KEY
BENEFITS FOR NASH *ROCKS***

CORPORATE SOURCE: QUARRY MANAGERS' JOURNAL LTD, 7 REGENT STREET, NOTTINGHAM
, NG1 5BS , UNITED KINGDOM

JOURNAL: QUARRY MANAGEMENT Pag: P39

PUBLICATION DATE: 19970800 PUBLICATION YEAR: 1997

LANGUAGE: ENGLISH SUBFILE: IRRD (I)

IRRD DOCUMENT NUMBER: 893164

ISSN: 0305-9421

DATA SOURCE: Transport Research Laboratory (TRL)

ABSTRACT: This article describes the use by Nash Rocks Ltd of a fibre-dosing system for producing stone mastic asphalt (SMA) at its plant at Dolyhir Quarry, Hereford and Worcester, England. The introduction of this system is part of the company's drive to ensure the quality and consistency of its SMA products. The decision to automate its fibre-dosing system was made for several reasons. It allows the company to address all aspects of COSHH, manual handling, and other health and safety legislation. It provides full traceability for the ISO 9002 quality assurance scheme. It demonstrates commitment to the production of consistent high-quality SMA. The wood-based cellulose fibre, used at Dolyhir, is a well-proven mixture of finely shredded waste paper and fine limestone filler, which has been used successfully in millions of tonnes of SMA, and which is an environmentally acceptable way of recycling waste paper products. As the fibre enters the doser, it is weighed accurately to obtain a precise amount for the required specific mix. The fibre is then conveyed to the mixer. The whole system is fully controlled by, and interlinked with, the site's main asphalt plant PLC controller.

?

12/3,K/1 (Item 1 from file: 2)

DIALOG(R)File 2:INSPEC

(c) 2002 Institution of Electrical Engineers. All rts. reserv.

03916902 INSPEC Abstract Number: A91087842

Title: Sensible heat storage used in a greenhouse

Author(s): Bouhdjar, A.; Boulbina, A.

Author Affiliation: CDER, Alger, Algeria

Conference Title: Energy and the Environment. Into the 1990s. Proceedings of the 1st World Renewable Energy Congress p.948-52 vol.2

Editor(s): Sayigh, A.A.M.

Publisher: Pergamon, Oxford, UK

Publication Date: 1990 Country of Publication: UK 5 vol. (xv+xiv+xv+xiii+xii+3267) pp.

ISBN: 0 08 037539 1

Conference Date: 23-28 Sept. 1990 Conference Location: Reading, UK

Language: English

Subfile: A

...Abstract: in a tunnel greenhouse. The excess of energy of the greenhouse is transferred to the *rocks* by *blowing* the air through the rockbed and when needed, the energy is restituted to the greenhouse...

?t 12/3,k/all

>>>KWIC option is not available in file(s): 14, 32, 293

12/3,K/1 (Item 1 from file: 2)

DIALOG(R)File 2:INSPEC

(c) 2002 Institution of Electrical Engineers. All rts. reserv.

03916902 INSPEC Abstract Number: A91087842

Title: Sensible heat storage used in a greenhouse

Author(s): Bouhdjar, A.; Boulbina, A.

Author Affiliation: CDER, Alger, Algeria

Conference Title: Energy and the Environment. Into the 1990s. Proceedings of the 1st World Renewable Energy Congress p.948-52 vol.2

Editor(s): Sayigh, A.A.M.

Publisher: Pergamon, Oxford, UK

Publication Date: 1990 Country of Publication: UK 5 vol. (xv+xiv+xv+xiii+xii+3267) pp.

ISBN: 0 08 037539 1

Conference Date: 23-28 Sept. 1990 Conference Location: Reading, UK

Language: English

Subfile: A

...Abstract: in a tunnel greenhouse. The excess of energy of the greenhouse is transferred to the *rocks* by *blowing* the air through the rockbed and when needed, the energy is restituted to the greenhouse...

12/3,K/2 (Item 1 from file: 8)

DIALOG(R)File 8:Ei Compendex(R)

(c) 2002 Engineering Info. Inc. All rts. reserv.

00557785 E.I. Monthly No: EI7608050174 E.I. Yearly No: EI76001432

Title: ON THE THEORY OF THE SPECTRAL ANALYSIS OF AEROSOLS BLOWN INTO A PLASMA.

Author: Simonova, V. I.; Raikhbaum, Ya. D.; Drokov, V. G.

Source: Journal of Applied Spectroscopy (English Translation of Zhurnal Prikladnoi Spektroskopii) v 21 n 5 Nov 1974 p 1435-1441

Publication Year: 1974

CODEN: JASYAP ISSN: 0021-9037

Language: ENGLISH

Abstract: Results of a method for determining beryllium in *rocks* by *blowing* powder samples into an arc discharge or a plasma jet are discussed. 22 refs.

12/3,K/3 (Item 1 from file: 63)
 DIALOG(R)File 63:Transport Res(TRIS)
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00743039 DA
TITLE: THE EASY ROAD TO SMA: NEW FIBRE-*BLOWING* PLANT PROVIDES KEY BENEFITS FOR NASH *ROCKS*
 CORPORATE SOURCE: QUARRY MANAGERS' JOURNAL LTD, 7 REGENT STREET, NOTTINGHAM , NG1 5BS , UNITED KINGDOM
 JOURNAL: QUARRY MANAGEMENT Pag: P39
 PUBLICATION DATE: 19970800 PUBLICATION YEAR: 1997
 LANGUAGE: ENGLISH SUBFILE: IRRD (I)
 IRRD DOCUMENT NUMBER: 893164
 ISSN: 0305-9421
 DATA SOURCE: Transport Research Laboratory (TRL)

TITLE: THE EASY ROAD TO SMA: NEW FIBRE-*BLOWING* PLANT PROVIDES KEY BENEFITS FOR NASH *ROCKS*

12/3,K/4 (Item 1 from file: 103)
 DIALOG(R)File 103:Energy SciTec
 (c) 2002 Contains copyrighted material. All rts. reserv.

03284917 GB-92-050237; EDB-92-047674
Title: Sensible heat storage used in a greenhouse
 Author(s): Bouhdjar, A. (CDER, Algiers (DZ)); Boulbina, A. (INRA, Algiers (DZ))
Title: Energy and the environment: into the 1990s. V. 2. Solar thermal technology
 Author(s)/Editor(s): Sayigh, A.A.M. (Reading Univ. (GB). Dept. of Engineering) (ed.)
 Conference Title: World renewable energy congress
 Conference Location: Reading (United Kingdom) Conference Date: 23-28 Sep 1990
 Publisher: Oxford (GB) Pergamon Press
 Publication Date: 1990
 p 948-952 (758 p)
 Report Number(s): CONF-900901--
 ISBN: 0-08-037539-1
 Language: In English

...Abstract: in a tunnel greenhouse. The excess of energy of the greenhouse is transferred to the *rocks* by *blowing* the air through the rockbed and, when needed, the energy is restored to the greenhouse...

12/3,K/5 (Item 2 from file: 103)
 DIALOG(R)File 103:Energy SciTec
 (c) 2002 Contains copyrighted material. All rts. reserv.

01559313 EDB-85-066087
Title: Increasing stability of mine workings under complicated mining and geologic conditions
 Author(s): Pin'kovskii, G.S.
 Source: Ugol' (USSR) v 7. Coden: UGOLA

Publication Date: Jul 1984
p 24-29
Language: Russian

...Abstract: complicated mining and geologic conditions in the Western Donbass (geologic faults, high water influx, weak *rocks* surrounding mine roadways, intensive floor heave, methane *blowers*, rock bursts). Types of yielding arched steel supports with increased yield strength and improved design...

12/3,K/6 (Item 3 from file: 103)
DIALOG(R)File 103:Energy SciTec
(c) 2002 Contains copyrighted material. All rts. reserv.

01406991 EDB-84-104791
Title: Sudden floor fractures and methane emission into mine workings
Author(s): Morev, A.M.; Kloizner, S.M.
Source: Ugol' Ukr. (Ukrainian SSR) v 10. Coden: UGOUA
Publication Date: Oct 1983
p 35-36
Language: Russian

...Abstract: Donetsk-Makeevka area of the Donbass. Analyses of rock strata deformation and mechanical properties of *rocks* in the roof show that methane *blowers* occur in underground workings in which a strong rock layer (e.g. strong sandstone) is...

12/3,K/7 (Item 4 from file: 103)
DIALOG(R)File 103:Energy SciTec
(c) 2002 Contains copyrighted material. All rts. reserv.

01100375 JPN-99-011481; EDB-99-081105
Title: Comments on the electron-cloud effect in the LHC dipole bending magnets
Author(s): Furman, Miguel A. (Center for Beam Physics, Lawrence Berkeley National Lab., Univ. of California, Berkeley, CA (United States))
Title: Proceedings of the international workshop on multibunch instabilities in future electron and positron accelerators
Author(s)/Editor(s): Chin, Yong Ho (ed.)
Corporate Source: High Energy Accelerator Research Organization, Tsukuba, Ibaraki (Japan)
Conference Title: MBI '97: international workshop on multi-bunch instabilities in future electron and positron accelerators
Conference Location: Tsukuba (Japan) Conference Date: 15-18 Jul 1997
Publication Date: Dec 1997
p 234-246 (345 p)
Report Number(s): KEK-PROC-97-17 CONF-970792--
Language: English

12/3,K/8 (Item 5 from file: 103)
DIALOG(R)File 103:Energy SciTec
(c) 2002 Contains copyrighted material. All rts. reserv.

00611456 EDB-80-050979
Title: Airborne fluorides and man: part I
Author(s): Smith, F.A.; Hodge, H.C.
Affiliation: Univ of Rochester Univ of California, San Francisco
Source: CRC Crit. Rev. Environ. Control (United States) v 8:4. Coden: CCECA

Publication Date: Jan 1979

p 293-371

Language: English

...Abstract: health are examined. Sources of airborne fluorides include volcanic actions, dusts picked up by winds *blowing* over surface soils and weathered *rocks*, sea spray, emissions from burning fossil fuels, and miscellaneous effluents disseminated from a wide variety...

12/3,K/9 (Item 1 from file: 323)

DIALOG(R)File 323:RAPRA Rubber & Plastics

(c) 2002 RAPRA Technology Ltd. All rts. reserv.

00301411

TITLE: AUTOMATIC DEVICE FOR FLASH REMOVAL FROM PARTS MADE FROM THERMOSETS,
USING COMPRESSED AIR

AUTHOR(S): Kotenko V D; Gol'dfel'd S Sh; Arzumanov E G

SOURCE: Plasticheskie Massy (USSR); No.4, 1983, p.54-5

JOURNAL ANNOUNCEMENT: 198601 RAPRA UPDATE: 198528

DOCUMENT TYPE: Journal Article

LANGUAGE: Russian

...ABSTRACT: was designed and produced by Khar'kov factory 'Mashpriborplastik', and works on the principle of *blowing* small objects such as crushed fruit-*stones* around the plastics component. Articles from this journal can be requested for translation by subscribers...

?

how files;ds

File 350:Derwent WPIX 1963-2002/UD,UM &UP=200251
(c) 2002 Thomson Derwent

File 344:Chinese Patents Abs Aug 1985-2002/Aug
(c) 2002 European Patent Office

File 347:JAPIO Oct 1976-2002/Apr(Updated 020805)
(c) 2002 JPO & JAPIO

File 371:French Patents 1961-2002/BOPI 200209
(c) 2002 INPI. All rts. reserv.

Patents

Set	Items	Description
S1	264	AU='WILSON J' OR AU='WILSON J H'
S2	4	S1 AND RESURFAC?
S3	1	S2 AND ROAD?
S4	244542	ROAD OR ROADS OR STREET OR STREETS OR BRIDGE? OR ROADWAY? - OR DRIVEWAY? OR DRIVE()WAY? ?
S5	1073	RESURFAC? OR REFINISH? OR RE() (SURFAC? OR FINISH?)
S6	20968	ROCKS OR STONES OR ROCKCHIP? OR ROCK(2N)CHIP? ?
S7	151846	BLOWER? OR BLOWING OR AIRBLOWER?
S8	68396	BROADCAST?
S9	5	S4 AND S5 AND S6
S10	1	S9 AND (S7 OR S8)
S11	0	S7 AND S4 AND S5
S12	154	S5(5N)S4
S13	0	S12 AND S7
?		

9/7/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2002 Thomson Derwent. All rts. reserv.

013565985 **Image available**
WPI Acc No: 2001-050192/200107

Manhole frame and cap assembly, has frame with three identical sloped ledges on inner wall of cylindrical portion, and frame insert with complimentary profile to that of ledges to provide height-adjustment

Patent Assignee: ARGIOFF E B (ARGI-I)
Inventor: ARGIOFF E B
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
CA 2270351	A1	20001103	CA 2270351	A	19990503	200107 B

Priority Applications (No Type Date): CA 2270351 A 19990503

Patent Details:
Patent No Kind Lan Pg Main IPC Filing Notes
CA 2270351 A1 E 6 E02D-029/14

Abstract (Basic): CA 2270351 A1

NOVELTY - The assembly includes two parts, i.e. a frame having a flat base and cylindrical portion perpendicular to the base, with three identical sloped ledges on the inner wall of the cylindrical portion, and a frame insert with its base having a complimentary profile to that of the ledges. When the insert is rotated and seated on the internal ledges in various positions different heights overall height may be obtained. The insert may have an internal flange or stubs to provide a hard bearing surface in which the manhole cap will sit.

USE - For use in new **road** construction or **road** **resurfacing**, where the assembly sits on a manhole shaft, adjustment rings, **stones**, mortar, bricks or any other suitable material.

ADVANTAGE - Is easy to adjust for height especially between placement of base asphalt, and subsequent placement of top asphalt, so ensuring that manhole frame and cap is not protruding at this time.

DESCRIPTION OF DRAWING(S) - The drawing shows a view of the base and cap assembly.

pp; 6 DwgNo 1/1

Derwent Class: Q42
International Patent Class (Main): E02D-029/14

9/7/2 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2002 Thomson Derwent. All rts. reserv.

013492878 **Image available**
WPI Acc No: 2000-664821/200064

****Road** **resurfacing** comprises applying a polymer modified concrete layer to a **road** surface, broadcasting **rock** **chips** on the layer, and raking the **road** surface to form anti-ponding lines**

Patent Assignee: WILSON J H (WILS-I)

Inventor: WILSON J H

Inventor

Number of Countries: 083 Number of Patents: 003

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 200055427	A1	20000921	WO 2000US6413	A	20000317	200064 B
AU 200038769	A	20001004	AU 200038769	A	20000317	200101
US 20020001506	A1	20020103	US 99272190	A	19990318	200207

Priority Applications (No Type Date): US 99272190 A 19990318

Patent Details:
Patent No Kind Lan Pg Main IPC Filing Notes
WO 200055427 A1 E 22 E01C-007/06

Designated States (National): AL AM AT AU AZ BA BB BG BR BY CA CH CN CU
CZ DE DK EE ES FI GB GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR
LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM

TR TT UA UG US UZ VN YU ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR
IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW
AU 200038769 A E01C-007/06 Based on patent WO 200055427
US 20020001506 A1 E01C-007/06

Abstract (Basic): WO 200055427 A1

NOVELTY - ****Road**** ****resurfacing**** comprises applying a polymer modified concrete layer to a ****road**** surface (16); broadcasting ****rock**** ****chips**** (24) on the polymer modified concrete layer (18) while it is wet; and raking the ****road**** surface while the polymer modified concrete is wet to form anti-ponding lines.

USE - For ****road**** ****resurfacing**** or repairing ****bridge**** decks.

ADVANTAGE - The invention avoids long traffic delays and provides a long lasting repair.

DESCRIPTION OF DRAWING(S) - The figure shows the application of the polymer modified cement to the ****bridge**** deck.

****Road**** surface (16)
Concrete layer (18)
****Rock**** ****chips**** (24)
Anti-ponding lines (48)
Wheel lanes (52)
pp; 22 DwgNo 3/9

Derwent Class: A93; L02; Q41

International Patent Class (Main): E01C-007/06

International Patent Class (Additional): E01C-007/32

9/7/3 (Item 3 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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013399736 ****Image available****

WPI Acc No: 2000-571674/200053

Land smoother and packer system has center, right and left blades which are pivotally attached to frame and extend individually about portion of center portion of frame, right and left wings, respectively

Patent Assignee: ALMER A D (ALME-I)

Inventor: ALMER A D

Number of Countries: 002 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 6119792	A	20000919	US 99289086	A	19990408	200053 B
CA 2272132	A1	20001008	CA 2272132	A	19990518	200060

Priority Applications (No Type Date): US 99289086 A 19990408

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 6119792	A		11	E02F-003/76	
CA 2272132	A1	E		E01C-023/00	

Abstract (Basic): US 6119792 A

NOVELTY - The system includes a frame (20) with a center portion (26), and left (24) and right (22) wings that are pivotally attached to fold upon the center portion. A center blade (50), a right blade (40) and a left blade (60) are pivotally attached to the center portion of the frame and extend individually about a portion of the center portion, right wing and left wing, respectively.

DETAILED DESCRIPTION - Rollers (70,72,74,76,78) are rotatably attached to the rear portion of the frame, and each formed with a solid outer surface. Adjustable wheels (30,32,34) are connected to the frame to support the frame upon a ground surface (12).

USE - For smoothing and packing irregularities in ground surface.

ADVANTAGE - Ensures effective and simultaneous smoothing and packing of ground surface irregularities. Reduces the time for harvesting field, thus saving harvesting cost for the farmer. Can be effectively utilized upon existing hay fields without damaging the existing plants and upon dirt or gravel ****road**** for ****resurfacing****

****road**** since land smoother and packer system is capable of windrowing ****rocks**** and other debris. Enables smoothing of mounds of dirt created by animals.

DESCRIPTION OF DRAWING(S) - The figure shows the upper perspective view of the land smoother and packer system.

Frame (20)
Right (22)
Left (24)
Center portion (26)
Wheels (30,32,34)
Right blade (40)
Center blade (50)
Left blade (60)
Rollers (70,72,74,76,78)
pp; 11 DwgNo 1/6

Derwent Class: P11; Q41; Q42

International Patent Class (Main): E01C-023/00; E02F-003/76

International Patent Class (Additional): A01B-029/06

9/7/4 (Item 4 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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009872289 **Image available**

WPI Acc No: 1994-152202/199419

Method for renovating embankment structure for railway track - involves initial removal of track down to embankment top followed by prodn. of horizontal upper surface fixture

Patent Assignee: BAUER SPEZIALTIEFBAU GMBH (BAUE-N)

Number of Countries: 001 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
DE 4236766	A1	19940505	DE 4236766	A	19921030	199419 B
DE 4236766	C2	19941222	DE 4236766	A	19921030	199504

Priority Applications (No Type Date): DE 4236766 A 19921030

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
DE 4236766	A1		6 E02D-027/40	
DE 4236766	C2		6 E02D-027/40	

Abstract (Basic): DE 4236766 A

The embankment (5) has on its top side a railway track (6) under which lies a bedding body (13) of three layers (2) of gravel or ballast between which are non-tractive components (3) comprising plastic weave, geo-textiles, or plastic grid.

Under this on the actual embankment material is a top surface fixture (4), whose E-module is clearly higher than the bedding body and the material of the rest of the embankment. This fixture can comprise large format ****stones**** or a well compacted gravel mixt. Above a support layer (13) is located a soft floor layer (7). After the top surface fixture is in place a friction floor is laid on it and then the railway track is relaid on the friction floor.

USE/ADVANTAGE - To renovate a railway embankment using a process which can equally apply to an embankment for a traffic ****road****.

Dwg.1/2

Abstract (Equivalent): DE 4236766 C

The dam is renovated (5) by preparing and fixing an horizontal top plane on the crest, and sinking high E-modulus piles (1) of ballast or gravel through the surface layer (4). The piles are spaced and driven down into the load-bearing ground (13) in a rotary boring operation.

The pile heads lie in cavities between top and bottom of the surface layer but without any direct contact, and the sealed cavity is then filled with ballast or gravel etc., using cylindrical or conical pile head holes. The surface layer is applied solid until drilled out for the piles, and is made up of lean or normal concrete or specifically graded and compacted gravel or ballast material.

USE/ADVANTAGE - Hydraulic engineering, dam restoration. Dam crest removed and ****re***surfaced**** and pile-anchored through to load-bearing ground for stability and resistance to traffic-induced subsidence.

Dwg.1/2

Derwent Class: Q41; Q42; Q49

International Patent Class (Main): E02D-027/40

International Patent Class (Additional): E01B-001/00; E02D-027/16;
E21B-007/00

9/7/5 (Item 5 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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004753069

WPI Acc No: 1986-256410/198639

Paving **stones **re***surfacing** method - handles cleaned paving**

****stones** in mobile implement for forming patterned arrays on pallets**

Patent Assignee: INT EFFICIENT PROD (ITEF-N); TB POLAK (TBPO-N); INGENIE HE
NOORDEN (HETN-N)

Number of Countries: 005 Number of Patents: 005

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
NL 8500418	A	19860901	NL 85418	A	19850214	198639 B
EP 256169	A	19880224	EP 86201420	A	19860813	198808
EP 256169	B	19900502				199018 N
DE 3670867	G	19900607				199024 N
NL 189867	B	19930316	NL 85418	A	19850214	199313

Priority Applications (No Type Date): NL 85418 A 19850214; EP 86201420 A
19860813

Cited Patents: DE 2335183; EP 164146; EP 47041; NL 8500418

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
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NL 8500418	A		13		
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EP 256169	A	E			
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Designated States (Regional): BE DE FR GB NL

EP 256169	B				
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Designated States (Regional): BE DE FR GB NL

NL 189867	B			E01C-019/52	
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Abstract (Basic): NL 8500418 A

****Re***surfacing**** of ****road**** surfaces, by using existing old paving ****stones**** is carried out in a ****road**** section where the paving ****stones**** have been removed. Cleaned ****stones**** are deposited in a bunker from where they are moved onto pallets for re-arranging in the required pattern. The pallets are then lifted by a crane for depositing in new re-layed sections.

The existing ****road**** surface (1) is removed from the sand bed (2), using a mechanical shovel (3) fitted with a rotor cleaner (4) for cleaning ****stones**** which are then stored in a bunker (6) of a mobile, pattern forming mechanism (7) in which the cleaned ****stones**** are deposited in the required pattern on pallets. Pallets are then moved by crane to sandbed section (5) for relaying.

ADVANTAGE - Time saving method. (13pp Dwg.No.1/3)

Abstract (Equivalent): EP 256169 B

A method of re-paving ****roads**** paved with paving ****stones**** or bricks, in which the ****stones**** or bricks are taken up from the existing paving, cleaned and stored, the sand bed is prepared, and the ****stones**** or bricks are re-laid, characterised in that the cleaned ****stones**** or bricks are supplied to a hopper (6) constituting part of a mobile pattern forming machine (7) positioned on the sand bed (2) between the old paving (1) and a part of the ****road**** already re-paved (5), and that, in said mobile pattern forming machine, the ****stones**** or bricks are automatically and one by one passed along a visual inspection station (27) and put in a desired position, and subsequently are automatically supplied to a section of a pattern

forming table (38) constituting part of said pattern forming machine, where the **stones** or bricks are automatically formed into laying units (43), which are stacked alongside the **road** and subsequently picked up by a paving machine (12) positioned on a portion of the pavement already re-paved, and laid on the meanwhile levelled sand bed between the mobile pattern forming machine and the re-paved **road** surface. (9pp)

Derwent Class: Q41

International Patent Class (Main): E01C-019/52

International Patent Class (Additional): E01C-023/12

?

WPI Acc No: 2000-664821/200064

****Road** **resurfacing** comprises applying a polymer modified concrete layer to a **road** surface, **broadcasting** **rock** **chips** on the layer, and raking the **road** surface to form anti-ponding lines**

Patent Assignee: WILSON J H (WILS-I)

Inventor: WILSON J H

Number of Countries: 083 Number of Patents: 003

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 200055427	A1	20000921	WO 2000US6413	A	20000317	200064 B
AU 200038769	A	20001004	AU 200038769	A	20000317	200101
US 20020001506	A1	20020103	US 99272190	A	19990318	200207

Priority Applications (No Type Date): US 99272190 A 19990318

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

WO 200055427 A1 E 22 E01C-007/06

Designated States (National): AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZW

Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW

AU 200038769 A E01C-007/06 Based on patent WO 200055427

US 20020001506 A1 E01C-007/06

Abstract (Basic): WO 200055427 A1

NOVELTY - ****Road** **resurfacing** comprises applying a polymer modified concrete layer to a **road** surface (16); **broadcasting** **rock** **chips** (24) on the polymer modified concrete layer (18) while it is wet; and raking the **road** surface while the polymer modified concrete is wet to form anti-ponding lines.**

USE - For ****road** **resurfacing** or repairing **bridge** decks.**

ADVANTAGE - The invention avoids long traffic delays and provides a long lasting repair.

DESCRIPTION OF DRAWING(S) - The figure shows the application of the polymer modified cement to the ****bridge** deck.**

****Road** surface (16)**

Concrete layer (18)

****Rock** **chips** (24)**

Anti-ponding lines (48)

Wheel lanes (52)

pp; 22 DwgNo 3/9

Derwent Class: A93; L02; Q41

International Patent Class (Main): E01C-007/06

International Patent Class (Additional): E01C-007/32

?

MAIL-IT REQUESTED: AUGUST 13, 2002

100J1V

CLIENT: KM
LIBRARY: NEWS
FILE: ALLNWS

YOUR SEARCH REQUEST AT THE TIME THIS MAIL-IT WAS REQUESTED:
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LEVEL 1 - 6 OF 295 STORIES

Copyright 1999 Albuquerque Journal
Albuquerque Journal

January 12, 1999, Tuesday

SECTION: Pg. 3

LENGTH: 512 words

HEADLINE: Vacuuming Yard One Way To Keep Debris at Bay

BYLINE: Franchesca Stevens For the Journal

BODY:

* Blowing leaves and grit collect in West Side yards making cleanup a challenge

Glynes Foster of Taylor Ranch has a landscaping problem, and it's a common one on Albuquerque's West Side.

It's all those leaves and sand that blow onto her yard.

"I'm particular -- let's put it that way," she says. "I like everything in its place and my surroundings to be neat."

So neat that Foster, the human resources director for the Rio Rancho Public School district, vacuums the rocks in her front yard.

Although she's been vacuuming her rock yard for years, she says curious passersby still stop to ask her what she's doing.

Foster is not alone in her problem.

Local lawn and garden experts say the West Side is harder hit by blowing debris because of all the new development and surrounding open space. But they agree that finding a solution is difficult.

"There's no real easy answer," says Rick Hobson, manager of Rowland Nursery on Irving NW. "We have wind and wind blows into the gravel, and then you get weeds growing above the weed barrier, not beneath it. And it's just a nightmare."

Erik Briones, owner of the Rio Rancho Garden Center, concurs.

"Keeping the sand out of the rocks is pretty doggone tough, especially around new development because they go in there, they scrape the land, they leave it bare and then the wind comes and it picks up all that sand. It's just nearly impossible to keep it clean.

"It will stop when development stops and everyone covers their yards with grass or rocks or whatever."

Foster uses a \$60, 1-horsepower, electric leaf blower/vac with an attached bag to suck up the leaves.

By the time she's done, she says she's covered in dirt so all that's visible "is the whites of my eyes."

"We're under the perception that this kind of landscaping is not a lot of work. But it really is. You have to stay on top of it to keep out that dirt that has blown in and weeds and leaves," Foster says. "Those rocks just kind of grab leaves, and if you don't clean them out, then your yard really doesn't look well-kept."

Foster estimates she spends a good portion of three days each year vacuuming her rocks.

To reduce the amount of dead leaves she has to clean up, she cut down a big cottonwood tree. Now, her front yard is landscaped with pea-sized rocks and juniper trees.

She says the yard requires no maintenance in the summer, but she more than makes up for it by the cleanup she must do the rest of the year.

But she says she doesn't want to blow the leaves and dirt off her property because she doesn't want to mess up somebody else's yard.

Sometimes she uses the leaves as compost for her flower beds.

"It's a dirty job. If there was an easy way, I wish somebody would tell me. If there is an easier way, I would love to know," Foster says.

PHOTO BY: JIM THOMPSON/JOURNAL

PHOTO: b/w

COME OUT WHEREVER YOU ARE: Glynnes Foster uses a portable vacuum to remove leaves and sand that have blown onto her West Side front yard. It's a common problem in the area, yet there are no easy solutions.

LOAD-DATE: January 13, 1999

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Birmingham Post

December 18, 1998, Friday

SECTION: Pg. 21

LENGTH: 504 words

HEADLINE: TARMAC BACK ON TRACK WITH POUNDS 200M RAIL DEALS

BYLINE: By James O'Brien

BODY:

Two contracts worth a total of pounds 200 million awarded by Railtrack yesterday helped lift the spirits of beleaguered Tarmac.

As the Wolverhampton company's pounds 1.8 billion merger with Aggregate Industries appeared to have hit the buffers, Railtrack's maintenance contract came into sight.

Railtrack has awarded GTRM, a joint venture company of Alstom-Tarmac, a four-year maintenance contract for its operations in South Wales from next April.

GTRM will also continue to maintain the West Midlands and Cambrian area lines of Railtrack for another five years.

The contract means Alstom-Tarmac is now responsible for about 20 per cent of the UK's railway network.

Mr Mike Casebourne, managing director of GTRM, said: "We are absolutely delighted at the outcome of the bidding process.

"Winning these two contracts confirms our ambitious plans for growth and substantial investment in the plant and personnel that will deliver a safe, quality service to Railtrack and its customers.

"I consider the result a reward for the great efforts made right across the organisation, from the trackside staff to the boardroom.

"Performance has been boosted to record levels and it shows that GTRM is a leading railway maintenance provider in this country."

Mr Casebourne said there would be a short period to celebrate the success of gaining the contracts, and then the company would get down to putting everything into place to mobilise them.

GTRM now holds maintenance contracts for four Railtrack zones.

The company is already the main contractor on the West Coast Main Line - Euston to Gretna Green; and the central band of England and Wales from coast-to-coast including track around Bristol.

A spokesman for GTRM said the company would increase its number of employees to meet with Railtrack's demands to match the investment it is planning.

GTRM has rolling stock from which crews can carry out overhead line work and lay ballast with a new "stone blower" which also levels it to the correct height.

The equipment replaces those jobs done in the past needing shovel labour.

Tarmac yesterday remained silent about its encounter with Aggregate Industries.

But anger remained on both sides after Aggregates' claims that it had been used as a stalking horse in a Tarmac merger agreement with Australian building materials group Pioneer.

Discussions with Pioneer collapsed at the beginning of the month but Tarmac has made it clear that it is keen to play a leading role in the industry's consolidation.

The talks with Aggregate ended when it rejected a one-hour deadline imposed on it on Monday to get an agreement on what it regarded as onerous financial guarantees.

The company said it found the deadline as totally unacceptable.

Tarmac and Aggregate had been talking for five months but had only been able to start due diligence last week.

Tarmac claimed that last minute revisions by Aggregate would have failed to get Tarmac board approval.

LOAD-DATE: December 18, 1998

MAIL-IT REQUESTED: AUGUST 13, 2002

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CLIENT: KM
LIBRARY: NEWS
FILE: ALLNWS

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American City & County

November 1998

SECTION: Road Construction; ISSN: 0149-337X

LENGTH: 515 words

HEADLINE: Ensuring safety in road work zones ; SIDEBAR

BYLINE: Tom Black

BODY:

Spray patcher speeds repairs in wake of El Nino
El Nio captured the nation's headlines last winter when its storms lashed California, causing flooding that posed considerable hardship to homeowners and farmers. The California Office of Emergency Services in Sacramento estimates that El Nio storms caused more than \$500 million in property damage across the state.

Damage estimates to the state highway system alone are at \$40 million and climbing. The crux of the problem is potholes, which are formed when excess water seeps into cracks in asphalt, softening the sub-base and making it easier for the wear and tear of traffic to break up the pavement.

"In my opinion, this has been the worst season we've had for potholes," says Richard Barner, senior highway maintenance worker with the Sacramento County Public Works Agency. "Combined with the cumulative effects of the last three years of above-average precipitation, we have more than double our normal amount of potholes."

Despite the fact that meteorologists had been predicting the phenomenon for several years, some of California's public works agencies took a reactive approach to El Nio. Sacramento County, however, decided that the best defense was a good offense and began preparing for the worst early last year, according to Don Gibson, a highway maintenance superintendent with the public works agency.

Late last year, the agency's fleet featured four open-bed patch trucks, four enclosed-bed patch trucks and one air-injected patching trailer. To improve its versatility, the agency purchased an RA-300 air-injected spray patcher from Rosco Manufacturing, Madison, S.D., and trained three people to operate it.

One person can operate the machine, which makes it easier for the agency to schedule nighttime repairs on roads with heavy daytime traffic. "We're using it every day," Gibson says, adding that the agency plans to purchase another one next year. The machine enables the agency to use fewer employees and repair potholes in less time since there is no need to rake or compact the patch material.

Operation of the spray patcher is fairly easy. The operator positions the truck behind the pothole to be repaired. Next, he uses a joystick to

position the one-piece, double-acting boom over the pothole. Once that is in position, a high-volume blower cleans out loose rock and debris.

Using the same nozzle as he used for the blower, the operator coats the hole with hot asphalt, which seals the area to be patched and prevents water from penetrating the repair. Next, with the push of a button, aggregate and hot asphalt are combined with the forced air to fill the hole. Finally, the valve controlling the hot asphalt is turned off, and a top coat of aggregate is applied.

Finding potholes is not a problem. "We just established a pothole hotline to encourage the public to report potholes and to keep up with the increased amount of damage," Barner says. "Also, our department supervisors report on potholes as they check the roads during the day."

LOAD-DATE: October 30, 1998

Copyright 1985 Times Newspapers Limited
The Times (London)

December 8 1985, Sunday

SECTION: Issue 8418.

LENGTH: 1526 words

HEADLINE: Innovation: High-tech on the tracks / British Rail research into cutting costs and improving services

BYLINE: PHILIP BERESFORD

BODY:

Rail passengers using the picturesque East Suffolk line to Lowestoft tomorrow will be in for a shock. Old-style signalling will have disappeared. No, British Rail is not deliberately provoking crashes. New, more economical, radio signalling is being introduced. Out go old metal tokens line have to hand over to the signalman, who then unlocks the signals and points: in come radios, VDUs and electronics.

Radio signalling is one of the many inventions to have come out of BR's research centre at Derby, where 800 scientists led by Dr Alan Wickens are taking the strain off the corporation's finances. Cost-saving ideas from Derby should help BR cut pounds 267m from its government grants next year against the 1983 figure of pounds 975m.

'Last year was very good for putting things into service which had an impact on the bottom line of the business in cutting costs,' Wickens says.

But it has not all been success. The research centre's pioneering work on the tilting mechanism for the ill-fated Advanced Passenger Train has not come to fruition. Rather than 70 APTs racing from London to Glasgow or other parts of BR's 11,000-mile ended up in the National Railway Museum in York.

Problems in making the tilt work without causing seasickness, and a disastrous debut in the winter of 1981m undermined public confidence in the train. However, it did break the London to Glasgow record last year at an average speed of 103 mph. The tilting technology will live on in a new class of coaches to be hauled by the Electra, BR's 140 mph electric loco for the 1990s.

The Derby centre was opened in 1964, the era of Harold Wilson's 'white heat' of technology. It is regarded as one of the world's top rail research centres. Most of its pounds 16m annual budget is directly funded by the various business sectors in BR - such as InterCity, Freight, Provincial Services or London and the South East; a quarter comes directly from the BR board which is sponsoring long-term research.

Wickens cites a new bogie (the pair of rail wheels and axles which carry the coach or wagon body) used on BR's 125 mph High Speed Trains as an example of the benefits of research percolating through to the business. 'It used to require 50,000 to 100,000 miles between the wheels having to be re-turned (to iron out

Times Newspapers Limited, December 8 1985

any bumps). Now we are achieving 500,000 miles which is considerably beyond what anyone else is achieving.'

The railbus - bus bodies welded to a Derby-designed rail sleepers on its high-speed lines during the notorious weekend engineering works.

TRACK MAINTENANCE, which costs BR pounds 200m a year, is one obvious candidate for economy through invention.

So Derby has come up with the Stoneblower, a machine that blows tiny stones under the sleepers on its high-speed lines during the notorious weekend engineering works.

Tests on a prototype Stone blower show it is a more effective way of keeping track sitting smooth and flat on its ballast (the stones under the sleepers) than traditional tamping, which involves pushing the existing ballast under the track. But the effect wears off very quickly, according to Peter McMichael of the research staff, so the old dips reappear in exactly the same place. After 21 weeks, the track can be back to its poor state again, requiring yet more tamping.

The stoneblowing machine, which runs on the track, can gently lift it in places where there are dips. A special tube is pushed through the ballast and compressed air pumps carefully weighed quantites of pebbles under the sleeper. The smooth track lasts longer with the stoneblower. In one trial, the old dips had not reappeared after some 118 weeks. One stoneblowing machine should replace at least three tampers, saving 'tens of millions of pounds a year in maintenance costs,' says McMichael.

Problems with welds between rails in the past have led to weaknesses or dips where rails meet. A new vehicle, which also runs on the track, has been invented by the centre to straighten the dip automatically by bending the track in 20 seconds.

Better still would be a ballast bed so smooth to start with that there were no dips at all in the track laid on top. Derby has come up with the idea of a bulldozer spreading the ballast before the track is laid, using a laser beam shining on the ground ahead to keep the blade level.

BR engineers hope the resulting smoother finish will enable them to raise line speeds quickly after maintenance. At present when new track is laid, for a week the ballast is bedded in with old jointed rails and the speed limit is 20 mph. Only after that is welded track put in place, which means more engineering work.

A smooth ballast surface means welded track can go straight down and the speed limit could be 40 mph or even 60 mph. This should cut down the time allowed in longer journeys for maintenance. The 5-hour run from Glasgow to London contains 20 minutes built in for maintenance work. If speed limits were increased to 40 mph, this could cut 10 minutes off the journey, worth pounds 2m-pounds 3m a year in increased revenue or lower costs.

DERBY also raises its sights above the track. A team is investigating new bogie designs. The trick is to lessen the weight as much as possible (to save wear and tear on the track) and to avoid spilling the gin and tonics in the

Times Newspapers Limited, December 8 1985

carriages above by improving suspension.

A new low track forces bogie is being developed for the freight sector, which is two tonnes lighter than the conventional bogie. It uses a narrower axle, cheap disc brakes and a rubber suspension system that ensures that the wagon barely moves when loaded or unloaded. This is important as many minor but none the less disruptive derailments occur when lightly loaded or unloaded freight wagons bounce around on the track and a wheel can come adrift of a rail.

The new bogie should also increase the speed of freight trains from 60 mph to 75 mph, vital when competing against large lorries using the expanding motorway network. Derby is also developing new technology for London's Underground, such as a self-steering bogie with a mechanical linkage to the rail body sitting on top. Prototypes are being built for use on the Central Line.

They will cause less wear and tear to wheels or track when taking tight curves and should save the Underground a considerable sum. At the moment, sharp curves have to be lubricated at a cost of around pounds 1m a year.

Smoother rides in high speed trains should be achieved by computers linked to what is called active suspension. As the bumps occur, electro-magnets on board read them and smoothe them out through servo-actuators (shock absorbers) placed between the bogie and the carriage body.

MAIN LINE signal boxes, like the large Three Bridges box on the London to Brighton line near Gatwick, control miles of track and replace scores of the older boxes. The large installations, which took more like control rooms for power stations have up to 30,000 special devices costing pounds 100 each.

It may be reliable technology each relay has a mean time between failures of 1,000 years - but it is very expensive. The future is to be found in Leamington Spa.

After 10 years' work, Derby has managed to come up with a modern computer signal box where chips do the work of relays and three computers work in tandem for a fail-safe system. The result should be a 20% reduction in signalling costs, worth around pounds 6m a year.

Adapting the computer technology from these main line installations, Derby researchers have come up with the low-cost radio signalling for the rural lines like East Suffolk and in Scotland.

Many of the Scottish Highland lines could owe their future to radio signalling. As signalmen are now needed at every passing loop on a single track line (where trains can pass each other), it is often not worth the while of BR managers to run trains late at night clocking up large overtime bills. Freight trains particularly have to wait overnight, cutting their competitive position against lorries.

But with one person controlling the line with an electronic display, messages going over the air waves to the train and telling the driver to stop or go via a special control panel in his cab, BR will be able to replace scores of signalmen (they will be retired or redeployed elsewhere in BR). As a bonus, the driver is in radio contact with the signalbox so that he can report any problems verbally to the controller.

Times Newspapers Limited, December 8 1985

The researchers are also investigating the designs for the next generation of passenger vehicles to replace BR's Sprinter trains, which are just entering service. The future trains will have special body designs enabling the vehicle to crumple in a controlled way in the event of a crash. Significantly, Derby has resumed work on automatically-controlled trains, which could presumably be run with the increasingly automated signal system.

Whether the public would take to trains with no drivers and no signalmen is questionable. Yet a new rapid transit system in the French city of Lille already operates very successfully with automated trains.

LOAD-DATE: September 21, 2000

LEVEL 1 - 281 OF 295 STORIES

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October 2, 1983, Sunday, BC cycle

ADVANCED-DATE: September 13, 1983, Tuesday, BC cycle

SECTION: Lifestyle

LENGTH: 338 words

HEADLINE: Some safety capsules for winter activities

DATELINE: NEW YORK

BODY:

Brush up on safety rules for using snow throwers, sleds, ice skates and cross country skis before winter comes, the National Safety Council advises. Tips include these: Snow throwers

Read and heed directions, the way you do with a power mower. Do not place hands, feet or loose clothing near any moving part. Never leave thrower running unattended. Keep children and pets away. The blower can pick up ice, stones or other hard objects and throw them at high velocity. The auger, which bites into and throws snow, appears to be the greatest injury producing part. Injuries from this source usually occur when operator attempts to clear debris from it or the chute without first shutting off the engine. Sledding

Never let children sled in the street, through intersections, or on ski slopes and toboggan runs. Pick a sledding hill in a park or recreational area where there is supervision. Make sure a first-timer knows how to use the steering bar and is able to move it to the limits of its flexibility. Sledders should ride lying down. Snow disc and plastic sliders are designed for riders to sit upright. If on a collision course, roll sideways off the sled. Protect head and face with arms and hands. Ice skating

Never skate in ill-fitting skates and never do it on thin ice - anything thinner than 4 inches. Shallow ponds (no more than waist-deep) and flooded fields are safe skating places. For proper ankle support, skates must fit. Skaters should avoid crowding together. Crowding makes it hard to avoid hitting a fallen skater. Cross country skiing

Cross-country skiing exercises the entire body but is done most safely by those who have taken instruction and know how to dress for the sport, how to fall, get up, and otherwise survive. Once one gets the hang of it, it's best to go touring with a group. Survival kit items for those going beyond well-traveled places: canteen, flashlight, nuts or candy to provide energy, a pocketknife, compass, map, matches in a waterproof container, first aid kit.

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Coal

March, 1981

SECTION: Pg. 80

LENGTH: 1309 words

HEADLINE: Air System Takes Rock to Surface

BYLINE: David Brezovec, associate editor

HIGHLIGHT:

A pennsylvania coal company uses compressed air to transport rock from low-cost mines to the surface. The pneumatic system has aided in construcion work.

BODY:

Rochester & Pittsburgh Coal Co. (R&P) of Indiana, Pa., plans to transport rock from its underground mines to the surface with low pressure, high volume pneumatic systems. From July to December, 1980, a pneumatic system in R&P's Urling No. 1 mine, near Shelocta, Pa., transported rock from a 1,200-ft tunnel driven to connect the Urling No. 1 and Urling No. 3 mines, both of which operate in the 52-in.-high Lower Freeport seam.

The system pushed 16,500 tons of rock 380 ft to the surface through an 8-in.-dia pipe. The system will stay at the Urling mines and pneumatic systems will be introduced into other R&P mines to eliminate underground gobbing and hoisting of rock.

Handling rock is troublesome in thin seams

Eugene Jones, vice president of operations for R&P, explains that continuous miners at most of the company's mines, which are located in thin western Pennsylvania coal seams, have to take up as much as 2 ft of bottom clay in belt headings. Gobbing this rock congests air courses, interferes with room development and takes workers off production crews. Using the hoist to take rock to the surface can interfere with supply deliveries.

Previously R&P transported rock to the surface on the belt during weekend shifts. This system was inefficient because clay will stick to the belt, wearing it out and making it less suitable for coal haulage. Also, beltlines from many of R&P's Keystone Division mines go directly to the minemouth Keystone Electric Generating Station, operated by Pennsylvania Electric Co., and is used without passing through a cleaning plant. Rock taken up on the belt must be diverted to a rock dump.

Now, R&P will transport clay, shale and sandstone to the surface through the pneumatic system. The system also can be used to backfill cavities caused by roof falls. The pneumatic system, supplied and installed at a cost of about \$150,000, consists of a Radmark airlock feeder, a positive displacement blower, a console with controls for the feeder and blower, and pipe and elbow joints.

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Coal, March, 1981

Rock is dumped into an 8-ton-capacity steel-reinforced ratio feeder hopper and is gravity fed onto a chain conveyor. A control gate maintains the flow into the pneumatic feeder at 50 tph -- the capacity of the pneumatic system. The system will accept minus-2-in. material. A metal grate on the feeder prevents large lumps from flowing into the system. A 960-rpm motor sends a 12-psi stream of air from the blower at 120 fps. The console operator controls the feeder and regulates air pressure to send the rock to the surface through a vertical borehole.

The rock handled by the pneumatic system from the tunnel construction project was already reduced in size by the tunnel boring machine used to drive the tunnel. A crusher will have to be incorporated into the system before it can handle mine rock cut by continuous miners.

For the tunnel construction project, the pneumatic system was located in a 10-ft-high space, 12,000 ft from where the tunnel boring machine began driving into the fault that separated Urling No. 1 mine from Urling No. 3. The tunnel boring machine fed rock into 8-ton-capacity side-dump mine cars. Two sets of five of these cars traveled on track laid between the tunnel borer and the feeder hopper.

Controlling the dust

Rock travels through the pneumatic system to the surface at 100 fps. During the tunnel construction, the rock was shot straight from the open end of the pipeline into the side of a hauler. Water was sprayed into the airlock feeder to control dust, but often the rock dried as it was forced through the compressed air system and a cloud of dust arose as the refuse shot out. If the outlet is ever located near farmland or homes, the rock will have to be shot into a bunker and filtered through a cyclone or bag filter.

Haydar Gezik, chief mining engineer for R&P's Keystone Division, which operates the Urling mines, says the pneumatic system caused no unexpected problems. Occasionally, the pipeline would clog up with clay, and water was pushed through the system to clean it. Also, the 90-deg elbow joints sometimes wore out, but this was expected and the joints were segmented so that each segment could be replaced as it wore out.

Low pressure keeps the system safe

Because the pneumatic system is a low pressure, high volume air system (without material in the system, air pressure is 6.5 lb at volumes of 5,000 to 6,000 cfm), it is safe in the mine environment, even when leaks develop.

Pneumatic hoisting systems, like the one being used to handle rock at R&P, are used in some European coal mines to transport coal. These systems feature capacities in the 80-tph range.

Coal at R&P's Urling No. 1, Urling No. 2 and Urling No. 3 mines is hauled to the surface on belts. The Urling No. 1 and Urling No. 3 mines are now connected by the tunnel and use the same 42-in. slope belt to the power plant. Urling No. 2 mine operates in the 42-in.-high Upper Freeport seam, directly above Urling No. 1. A borehole is being blasted from Urling No. 2 to Urling No. 1. When this project is completed, the three mines will share a common transportation system to the power plant. Coal mined at Urling No. 2 will drop to Urling No. 1's

Coal, March, 1981

belt. Coal from both mines will travel on a belt through the recently opened tunnel into the Urling No. 3 mine. The coal from all three mines will then travel to the preparation plant on the Urling No. 3 slope belt.

Five miles in 50 minutes

Approximately 7,000 tpd will arrive at the power plant through this belt system. Coal starting at the farthest point from the plant, in sections at Urling No. 2, will make the 5-mile trip to the plant in about 50 minutes.

R&P opened the tunnel between the Urling No. 1 and Urling No. 3 mines with a Jarva Mark 12-1400 tunnel boring machine. The machine, used in the construction industry for hard rock tunneling, was modified for permissibility in the underground coal environment with fully enclosed motors and electrical cabinets.

The machine, operated by the Williamson Shaft Construction Co., cut a 14-ft-dia hole through sandstone, shale and coal at 12,000 psi. As rotary torque and forward thrust were applied to the full face cutting wheel, disc-type cutters penetrated the rock in a circular kerf pattern. This caused the rock to spall and break out of the tunnel face. The material was conveyed automatically to a muck handling system at the rear of the machine and dumped onto the mine cars.

Exhaust fan ventilates the face

Water sprays and ventilation were used to suppress dust. A dust shield was mounted 4 ft from the cutting face and ventilation tubing was extended from the shield to a 30-in. exhaust fan that pulled air through the tunnel section. The tunnel and pneumatic system location were ventilated in the same manner as a regular mining section but without the high volume that characterizes coal mine ventilation.

Three headings were driven to the fault where the tunnel boring machine began working. Two of these headings were used for intake and one for return air. A separate split of air from one of the intake headings was directed into the area where the pneumatic system was in operation. The other went to the face of the tunnel, across the face, through the dust shield and out of the section through the ventilation tubing.

The 6-ft-dia borehole that will connect the Urling No. 2 and Urling No. 1 mines through 70 ft of rock is being drilled and blasted. A 10-in.-dia pilot hole was drilled from the surface through both mines. An air drill widened this hole between the mines to 24 in. in diameter. The area around this borehole is drilled and blasted using 4-ft blast holes. Material falls into Urling No. 1 and is gobbled in a nearby room. Soon the pneumatic system will be called in to transport this rock to the surface.

GRAPHIC: Picture 1, A control gate at the base of the 8-ton-capacity feeder hopper keeps the coal flowing onto the conveyor at 50-tph.; Picture 2, Coal from the conveyor falls into an airlock feeder that feeds it into the compressed-air chamber.; Picture 3, On the surface, the mine rock is sprayed into a pile. It is loaded onto trucks by a front-end loader and used for road construction.; Picture 4, A positive displacement blower pushes air through the airlock chamber where it picks up rock and pushes it to the surface.; Diagram 1, The slope belt for R&P's and Urling No. 2 mine will be eliminated when the borehole to Urling

Coal, March, 1981

No. 1 is completed.; Diagram 2, Tunnel rock is loaded onto mine cars that run on track laid between the tunnel boring machine and the pneumatic system.; Diagram 3, The pneumatic hoisting system consists of an airlock feeder, a blower, a control console and pneumatic tubing.; Pictures 5 and 6, The rock, pushed by air, makes a 90-deg turn in the pneumatic tube on its journey to the surface. The 90-deg elbow joints are segmented. Sections can be replaced as they wear out.; Picture 7, The tunnel boring machine was assembled in an excavated area at the fault.; Picture 8, A Jarva Mark 12-1400 drove the 12,000-ft tunnel. Air was pulled from the tunnel face through ventilation tubing.

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SECTION: No. 8, Vol. 198; Pg. 61; ISSN: 0033-8826

IAC-ACC-NO: 19697470

LENGTH: 1604 words

HEADLINE: For railroads, an m/w wish list; maintenance-of-way

BYLINE: Welty, Gus

BODY:

Chief engineers say they want higher productivity and reliability as well as improved flexibility and maintainability all at lower cost. Will suppliers deliver?

It first glance, railroad chief engineering/maintenance-of-way officers seem to be asking equipment manufacturers for machines that combine the best of all possible worlds--something which may or may not be attainable.

Chief engineers want high-production, multi-function machines, which at least implies big, perhaps complex, on-track equipment. At the same time, eyeing work windows that continue to shrink as traffic increases, engineers long for on-track machines that can run-to-clear quickly or be removed from track at the work site, which at least implies smaller, more versatile and flexible pieces of equipment.

This is a dichotomy that will have to work itself out. In the meantime, if chief engineers are united in their opinions, it is over issues of improved quality of life for m/w employees and of a need for much-improved and better-integrated m/w materials handling systems.

Work environment issues have been addressed. Work environments are cleaner, quieter, and more comfortable than they have ever been, although operating an m/w machine will remain a tough, demanding job. Improved safety is a primary concern as railroads are being prodded by the Federal Railroad Administration and the Brotherhood of Maintenance of Way Employees even as they reinforce their own belief that improved safety makes sense in every way.

As for the emphasis on materials handling, this is something that some engineers latched onto early. For example, Bill Glavin, former Burlington Northern system chief engineer, was wont to refer to the Tamper P811 as a big materials handling system. He was also quick to spot a need for developing methods and machines for handling rail flaws quickly after they are detected. And both of these issues--materials handling and rail repair improvements--are on Burlington Northern and Santa Fe's wish list as problems still in search of solutions.

GOOD POINTS, BAD POINTS

As for the machines that have made major recent contributions, Conrail cites multi-functional track geometry cars and improved GRMS vehicles, Fairmont Tamper's New Track Construction (NTC) machine, computer-aided production switch tampers, and special equipment for use with Pandrol fasteners.

Like a number of other roads, CR sees need for more automated, multi-functional machines that can make more efficient use of available track time. It, and other roads, are not pleased with the increased complexity of some onboard systems, nor with machines that encroach on an adjacent track while they perform their work, nor with reliability problems that keep cropping up.

For its part, CSX Transportation has praise for today's continuous action tampers and rail grinders, but is highly critical of today's hydraulic systems: "The design is not much beyond Stone Age technology. They're [the systems] designed to leak and ultimately are our highest-failure components. The design engineers haven't solved the problems associated with temperature extremes, vibration, and grit abrasion on hydraulic systems."

Union Pacific has a list of most-valuable developments that includes high-production tampers and switch tampers, better grinding technology, and development of dynamic track stabilizers and improved dust collection systems. UP also makes particular mention of the new track geometry car it developed in conjunction with Plasser American, and it hails gains made in computerization of m/w machines' operating systems and maintenance.

Especially as railroads grow bigger through merger, UP calls for more railroad-supplier dialog--and for more investment in research and development.

Like UP, Norfolk Southern cites a piece of home-developed equipment as being most worthwhile, a brush cutter that can work without a counterbalance. Like a number of other roads, NS zeroes in on materials handling issues. And the amount of strong talk about this subject does give rise to questions as to why the problems haven't been addressed before.

BNSF checks in with praise for the Plasser American RM802 ballast maintenance system and the Loram Vista grinding system, which has been a significant contributor to better rail profile management. Georgetown Rail Equipment's Dump Train also gets high marks as a ballast handling system.

And BNSF has good words for versatile materials handling machines such as back hoes and track cranes. Now, it is working with several equipment manufacturers "on the development of a tie handling system for wood ties that will eliminate the need for pre-unloading of the new ties and post-cleanup of the scrap ties, thereby reducing required track windows."

Wisconsin Central is yet another carrier conscious of materials handling needs, specifically for an automated tie plate handling system. At the same time, WC praises the "automation" of tasks involving such things as anchor placement and tie plugging that had been handled manually.

Canadian National sees much that's good in development of CAT equipment, dynamic track stabilizers, and in-track welding units, as well as the Stoneblower ballast/tamping system for which Pandrol Jackson recently won

acceptance in Great Britain.

ROOM FOR IMPROVEMENT?

In an overall sense, it would appear that as of 1997, chief engineers are reasonably satisfied with the capabilities of the roadway-and-track machines on the market--although a number of them also believe that suppliers still have a long way to go in improving reliability, better trouble-shooting diagnostics notwithstanding. What engineers keep returning to is the need for better, more organized materials handling systems to create a faster, smoother maintenance operation.

Conrail, for example, calls for further automation of bulk-handling machinery that can provide direct feed to the workhead (spikes, lags, clips, anchors, etc.), for further development of faster spikers with hole finders, and for availability of more multi-head automatic equipment such as the multi-spindle tieborer.

Like many other roads' engineers, CSXT's call for better ways of handling tie plates, which still must be removed and replaced by hand.

In a broader sense, CSXT declares that another major need is for "an on-track materials handling system for such things as spikes, new ties, scrap ties, and other materials. This would reduce track occupancy in advance of and behind the track teams. Material could accompany the work process as an integrated activity to production. This would also eliminate the need for extended curfews to deliver material ahead of the production schedule and then later to pick up scrap."

Union Pacific sums it up: "We believe that there is still great opportunity on the materials handling side, such as with rail and ties. We still spend a lot of time, effort, and money to get the material out to the job site and to clean up after the installation process is completed. If we review it from a cradle-to-grave aspect and [count] the number of work windows, work trains and so forth that are required to do the whole job, [it's obvious] there are great opportunities for savings."

As for reliability issues, CN says manufacturers "must continue to place importance on the productivity and reliability of the unit. With increasing rail traffic, reduced work windows, and reduced m/w forces, it is essential that maintenance-of-way forces are provided with equipment that will enable them to increase track maintenance productivity per available track-hour and/or employee-hour." Full service/complete operation with productivity of individual pieces of equipment balanced as with Fairmont Tamper's Tie Master concept, CN says, is one example of an innovative approach to improving productivity and reliability.

UP is blunt about both productivity and reliability:

"We are searching for higher-production equipment that is easily removed from the track when required, thereby enabling us to work within ever-decreasing work windows. We want to see improvements in self-diagnostic equipment that allows operators to readily pinpoint problems and solve or repair them. The results are increased up-time for the machines, increased gang productivity, and lower costs.

Railway Age August, 1997

"Reliability? Even new machines continue to have too many failures within and during the start-up and initial break-in period." Definitely, UP says, railroads need better diagnostics that are "more operator-friendly to enable operators to make running repairs."

UP's conclusion: "When you consider the high initial purchase cost of the machine, what down-time costs in terms of loss of gang productivity and lost work-window opportunity, and multiply this over the life of the machine, there exists a tremendous opportunity for savings directly related to improved equipment reliability."

UP, of course, is the road that closed down its busiest coal line between North Platte and the entrance to the Powder River Basin for a week last year to build additional track and complete six months' maintenance in six days; the project worked so well that UP did it again this year.

Not every road has the opportunity to do what UP has done, but some do--and the merger movement will provide more opportunities by creating single-line alternative routes within a system.

What else will provide "more opportunities" for improving productivity and reliability? More partnerships with suppliers, with both working toward those goals.

GRAPHIC: Photograph; Illustration

IAC-CREATE-DATE: September 22, 1997

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LEVEL 1 - 16 OF 22 STORIES

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Extel Examiner

June 13, 1997, Friday

SECTION: Company News; Other

LENGTH: 154 words

HEADLINE: Railtrack to spend 21 mln stg on track maintenance system

BODY:

LONDON (AFX) - Railtrack Group PLC said it will invest around 21 mln stg on revolutionary new technology to maintain Britain's railways.

The first computer-controlled 'Stoneblower' track maintenance machine has been on trial in Britain and will be joined by another seven machines, to be built and delivered over the next two years, Railtrack said.

It said the investment forms part of Railtrack's commitment to spend 16 bln stg on the rail network over the next 10 years.

Railtrack said trials have shown track work done by Stoneblower lasts up to four times as long as traditional methods, which reduces the amount of time lines are closed for engineering work.

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March, 1995

SECTION: Vol. 196 ; No. 3 ; Pg. 31; ISSN: 0033-8826

LENGTH: 3436 words

HEADLINE: Making tracks for growth; maintenance of way equipment improvements;
The Builders: M/WCover Story

BYLINE: Welty, Gus

BODY:

Designing high productivity m/w equipment friendly to the environment, the workers, and the number crunchers is the challenge. Here's how builders are responding.

If you believe that technological development in roadway-and-track equipment and materials has lagged behind development in other areas of railroading, you haven't been paying attention.

If suppliers of equipment and materials for these below-the-wheels areas had not done what they have done, railroads would not have an infrastructure that's better than it's ever been, and they would not have the potential for making it even better in order to meet the increasing needs for superior track performance to handle more traffic and heavier loads.

Developers of improved roadway-and-track equipment and suppliers of improved materials don't get the publicity that goes to locomotive and freight car manufacturers. But without what they've done and are doing, above-the-rail advances would be a lot less meaningful.

It's a safe bet that what these suppliers do will be getting a lot more attention in the future, as traffic increases and as the need for more-productive maintenance equipment goes up along with it, even as the maintenance windows become narrower.

Parallel to this is the need for developing better quality track materials that will last longer so that maintenance and replacement cycles can be stretched. And at the same time, equipment suppliers are under the gun to design machines that are more environmentally friendly and ergonomically improved.

Can they meet the challenges? They can, and they are, although the challenges are big ones, since roadway-and-track maintenance is by its very nature tough and dirty work.

* Forging user relationships. Manufacturers are also getting closer to their customers as, for instance, in the group meetings Fairmont Tamper has held with users of its Mark IV tamper; one such session was held in February 1994 and another is scheduled for this month. User-supplier relationships can only improve if and as this idea spreads.

First, consider recent developments in m/w equipment. The Mark IV is a good example, illustrating technological advances for improved productivity along with ergonomic improvements for the operator.

The machine has a quick-deployment reference system for fast setup. It features an improved computer-based control system to provide automatic ramping, automatic superelevation, continuous crosslevel monitoring, automatic zeroing of references, and a fixed surfacing shadow-board. Lining systems that line through curves without pre-plotting, or provide best-fit of curves with the ability to adjust the fits, use curve data on disks directly from an analyzer car and print out curve data and graphs.

As for ergonomic/environmental factors, a new-design cab has air bag suspension, stair-type steps for access, and a decibel reading of just 74db with door closed, vibrators running, and the air conditioner turned on.

Working functions of the Mark IV are controlled by a Motorola 68000 computer with new software based on a high speed multi-tasking operating system designed by Fairmont Tamper that provides for performance of a large number of concurrent tasks (23 on the Mark IV) without compromising individual task response (2 milliseconds, worst case).

The manufacturer has also developed software upgrades for its Compu-Liner track lining system on both the Mark III and Mark IV tampers. These provide enhanced accuracy in calculation of blends in spirals, superelevation, compound curves, and fitting into and out of fixed points.

The system automatically operates the lining system during tamping, providing the operator with the flexibility to make changes to suit actual track conditions while maintaining ease of use and computer accuracy.

* Faster, easier. For its part, Plasser American has developed and is now producing high speed switch tamping machines that not only tamp two ties simultaneously in switches but also incorporate an auxiliary turnout rail lifting unit integral with the machine's lifting control system.

These machines, the manufacturer says, will provide rapid and accurate switch tamping and surfacing with reduced stress on switch rails and ties, while they also eliminate the need for hand placement of auxiliary track jacks.

Plasser American also weighs in with its switch exchange system, WM-40, for removal and installation of track panels and switches. Even No. 32 switches with concrete ties can be handled "with ease," Plasser says. "The operation requires a minimum of track outages, thus allowing revenue traffic to resume in a shorter period of time as opposed to conventional switch exchange methods."

Ask Nordco what's new, and the talk turns to product introductions in areas that were not previously mechanized, specifically the M.sup.3 modular maintenance machine and the Model 67 anchor remover.

The M.sup.3 was developed as a screw spike setter-driver, as railroads increased their use of screw spikes, but it can accept other workheads to perform such functions as boring, spike pulling, and spike driving.

The anchor remover eliminates the need to manually remove anchors, using a patented process to remove either drive-on or spring anchors with the same tooling; it can be equipped with modules over each rail in order to remove up to four anchors at a time.

Fairmont Tamper, meanwhile, has taken a lot of the manual labor out of anchor application, with development of a chute system into its anchor boxer applicator in which the operator merely drops anchors into the chutes, from which they are automatically placed on applicator arms at the proper time.

Kershaw's most recent development is the Kribber Adzer Model 38-4, combining features of machines which have been in use for many years. This unit removes crib ballast and adzes existing ties for placement of new rail.

Ergonomic and environmental factors played a big part in the design: The cab is enclosed, pressurized, heated and cooled, and a dust-control system collects dust and wood pieces, benefiting both the operator and other workers in the gang.

* Dust-eating grinders. Pandrol Jackson, meanwhile, recently developed a self-propelled modular production transit grinder that can be configured for an eight- to 24-stone consist. A 16-stone consist built for the Hong Kong transit system includes a number of features which PJ says were not previously available on transit grinders.

The machine has a track vacuum system to clear the track bed of grinding residue and a dust-collection system to pick up airborne grinding debris through intake hoods located above each grinding carriage. In addition, the unit is equipped with a corrugation measurement system which uses a pair of measuring wheels mounted in a specially designed carriage which acts as a rolling straight edge reference beam; eddy current displacement transducers send signals to the measurement computer for display of corrugations. Hong Kong's machine also has a laser optical profile measurement system to assist the operator in selecting grinding patterns by graphically overlaying the desired profile on the measured profile for comparison.

In the U.S., Pandrol Jackson operates a fleet of 10 switch and crossing grinders, and it has begun retrofitting them with dust collection systems. The first unit went into service on Conrail in January, and more of the fleet will be upgraded as the need develops,

Similar improvements are being made to the Model 6700 tamper to improve reliability and maintainability, with the help of input from a focus group of machine operators and mechanics. And after field testing, PJ recently introduced a new tamping tool with a 100% carbide tip attached to a hardened shaft. The goal: To provide a tool that will last for an entire tamping season.

* Stoneblower fallout. While all this is going on, Pandrol Jackson is also working on a contract to build eight stoneblower machines for Railtrack use in the United Kingdom, with the first machine now completed and under test.

Pandrol Jackson says that this new concept in surfacing isn't expected to have an immediate market in North America, but that elements of it are intended to become part of the technology used in improvements to the company's line of tampers. Among them: A workhead design that utilizes a new vibration control

concept; advanced servo-hydraulic and electronic controls that minimize cycle time and provide improved positioning control; and a variety of transducers in the stoneblower design that relate to hydraulic cylinder positioning, reference wire position detecting, tie detection, and traction system monitoring.

In addition, the stoneblower uses a methodology for track geometry measurement for both pre- and post-maintenance phases that can have a direct bearing on the accuracy and quality of tamping and that Pandrol Jackson expects will provide a basis for improvement in future tampers.

Other suppliers also have a number of new and improved products currently under development.

Fairmont Tamper, for example, is nearing the production/marketing stage on at least three machines: the TKO II tie remover-insertter, the W96 Series E spike setter-driver, and the RGH8 Series B rail grinder.

The TKO II holds tie plates in place while it removes and inserts ties, eliminating the need for machines and personnel to handle plates. The machine will remove an old tie and insert a new one in one spotting, but to do this automated tie-handling is required. The TKO II does this by picking up new ties from on top of the rails and depositing old ties perpendicular to track on the shoulder.

As for the spike setter-driver, Fairmont Tamper says that "after nearly 20 years, the love/hate relationship between many railroaders and the wheel-type spike feed will soon give way to a new spike feeding mechanism" on the W96. The new "swing feed" system is part of an upgrade that will also include a programmable controller for machine cycling, a rolling gauger, multi-function joystick controls, and improvements to the hammer mounting area.

Development of the Series B eight-stone crossing and switch grinder--the "green machine"--was prompted by stricter requirements regarding noise and dust control, and by international track machine specifications. The new machine will feature separate power and grinder cars, maximum-visibility temperature controlled cabs, a high efficiency dust/particulates collection system, and full enclosures for the engine, hydraulic system, and dust collector to minimize noise.

A new dust collection system is also being designed by Kershaw for use with ballast broom attachments for ballast regulators. And the company has been working on the Model 47-5 tie-replacer for high-production-rate tie renewal. In this unit, the entire extractor/insertter assembly turns on a slewing ring, permitting operation from either side without the need for turning the machine. It is also equipped with a hydraulic flipper cylinder that allows for tie removal and replacement in cuts and other space-restricted areas.

Kershaw also calls attention to improvements being made by engine manufacturers because of emission control requirements and demands for increased efficiency. These improvements, soon to be applied to track machines, principally involve electronic systems for monitoring and control.

Loram Maintenance of Way is promoting its VISTA system, a rail profile analyzer that it's saying brings grinding "strategy" to new heights. These units are located at each end of a Loram grinder to dynamically produce electronic

images of the railhead within .005-inch accuracy at speeds of up to 15 mph.

The images then developed are compared to the desired rail profile, as specified by the railroad, and the results are displayed on a computer monitor. From this information, the operator determines the grinding pattern and the machine speed to achieve the desired rail profile that satisfies the metal removal requirements. VISTA then provides a quality check by comparing the post-grind profile against the desired profile.

And if you are looking for really heavy equipment, Burro Crane has developed the Model 55 25-ton locomotive crane, which incorporates many of the features of the Model 50, Series B, 20-ton crane introduced two years ago. Both cranes have a three-section, equilateral extend/retract boom which will allow the operator to reach far from the machine's centerline while it can also be retracted to a compact size for working in tight-clearance areas.

Burro has also come out with its Model 67 on/off-rail excavator, to provide smoother hydraulic control, increased off-rail stability, greater surface reach, and greater digging depth.

Basic track materials? The AAR's Research and Test Department will call attention to ever-cleaner rail steels being produced by Pennsylvania Steel Technologies and CF&I. There are few complaints these days about the quality of concrete ties, but rail-seat abrasion continues to be a baffling problem, a phenomenon found only in North American concrete tie applications. However, fixes have been developed.

As for ballast, equipment suppliers have come up with a number of better ways of handling and distributing this rather mundane but vital part of the track structure.

* Automated delivery systems. Plasser American has come in with BDS, its ballast distribution systems that allow excess ballast to be picked up and distributed where it's most needed. This capability reduces expenditures for new ballast and makes it possible for ballast to be accurately placed for out-of-face surfacing, switch and interlocking tamping, and fill for areas where ballast is inadequate in order to improve track stability. BDS is also designed to provide for transfer and distribution of new ballast.

Two such systems are operating in Noah America, one owned by CN North America and the other by Amtrak: "These systems provide a very high return on investment not only because of reduced ballast purchases but also because of a reduction in work train requirements," says Plasser American.

Eighty-year-old Difco is strong in the market with its Auto Ballasterr system that provides for radio controlled ballast distribution at distances of up to one football field length (100 yards) from a car. Solenoid operated valves respond to a radio signal to a microprocessor on each car; the result is that ballast can be distributed evenly, as needed, while employee safety is enhanced--no more use of pry bars on gates, no more need to walk the train, no more need to be exposed to ballast dust.

Railroads using the system are also saving money by using less ballast, up to 17%, because of the system's accurate flow control. CSX Transportation, Santa Fe and Norfolk Southern are major users of what CSXT has called "the hands-off

approach to ballasting."

Difco began development of the system about five years ago in conjunction with Norfolk Southern, and orders came in. CSXT, for example, started with an order for Difco to convert 162 cars equipped with Miner AggreGates and followed with an order for conversion of an additional 216 cars.

In some ways, infrared sensing control is better than radio control because it's more direct. But it never caught on, although Miner offered it, and so what Miner now has are radio controlled cars, about 250 of them, with an order just completed with UP and a bid out on another order.

Georgetown Railway Equipment can tell a story with a different slant: Its patented Dump Train was designed as a piece of revenue equipment to provide railroads with a better way of penetrating the short-haul aggregates market dominated by trucks. Railroad maintenance-of-way people took a look and saw an m/w application.

The train offered 2,000-ton-per-hour unloading speed, along with ability to transfer lading using a 50-foot boom. And it caught on, for use by Southern Pacific, Union Pacific, and Georgetown Railway, soon joined by Burlington Northern.

A standard GREX train is 15 open-top hopper cars with bottom-discharge hydraulic gates that feed a conveyor belt running the length of the train. A transfer car then loads the material onto the 50-foot-long boom that pivots to either side of the track.

During the 1993 Midwest floods, GREX says, the equipment went through more than 270 days of service with never a missed delivery because of mechanical failure. In service then for UP and BN, the system demonstrated its ability to dump large quantities of material, ahead of itself and in motion.

The system also has the capability of working track construction projects, stockpiling ballast or sub-ballast in advance of work gangs. This year will be the fourth year in which BN will be utilizing Dump Train in capacity expansion projects in the Powder River Basin.

Then, there's the GREX Slot Machine, in effect an "endless" gondola unit riding on articulated 100-ton trucks and designed to deliver oversize riprap. It's unloaded by a track hoe that travels the length of the train, riding on the car floor and capable of unloading 12-inch riprap at a rate of more than 400 tons per hour.

For its part, Herzog Contracting has automated two types of ballast cars. One is a so-called standard 100-ton car equipped with MK-style doors; the other is a 100-ton, six-pocket crosshopper used for ballasting behind an undercutter-cleaner or ahead of a surfacing gang. The doors are remotely controlled using an electric-hydraulic system.

In addition, Herzog has adapted two strike-off plows to each car, also automated and using the same hand held controller used to open and close the doors. The plows eliminate the need to use a crosstie ahead of the car track to strike off ballast.

This is a company that has come a long way from the days when it was known primarily as a company that cleaned up after derailments. Herzog has also developed an automated, self propelled clip car for applying the McKay-type insulator and fastener to concrete ties, working behind a Fairmont Tamper P811 machine. And it has a machine designed for laying new wood or concrete ties on newly-prepared grade.

Once the ties are pre-spaced and placed on grade by this self propelled and self contained machine, Herzog says, rails are threaded on ties and fasteners applied: "When properly supported, this machine will lay up to one mile of track per day."

Rail welding is another area where advances are being made. In-plant welding of quarter-mile-long rail strings is common, and so was thermit welding of the strings in the field. Tests at the Transportation Test Center produced mediocre results on thermit welds, but suppliers stepped up. One that gets high marks for improving the process is Orgo-Thermit.

Still, field flash-butt welding seems to be the method of choice, and there is a new player in the market, Chemetron True Temper, with its 35 years of experience in rail welding. Chemetron has aligned itself with E. O. Paton International of Vancouver, and E. O. Paton Welding Institute in Kiev, Ukraine, developer of portable in-track flash-butt welding heads.

These relationships are going to help increase railroads' options for in-track work and also provide Chemetron entry to new international markets through an agent.

The leader in the market, however, is still Holland, and it has been developing new products to stay ahead. In recent times, Holland has introduced a web pollsher to obtain bright metal before welding, and a base grinder to remove excess metal after welding and shearing. It has designed a container-based welding unit, and has developed a process for job site welding of contact rail for transit systems.

And, Holland can provide 80-ton and 160-ton rail pullers and a 280-ton superpuller to bring rail strings together when new rail is being laid or to do repair welding where defects are being cut out.

All of the great products and systems come to naught, though, without the little pieces known as fasteners that hold track together. Fortunately, R&D in these areas has kept pace. Pandrol's Fastclip, for example, was a winner from the time it was introduced last year. But Safelok is coming on strong, and Kerr McGee has an improved version of its RailFast design.

Problems remain with track structure and how to make it better. But solutions are either there, or getting awfully close, with the R&D efforts being made by major suppliers.

GRAPHIC: Photograph

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"Kentucky's Asphalt Animals"

"Resurfacing"

Resurfacing an area involves the placement of one or more asphalt overlays on top of existing pavements. A hotmix asphalt overlay can include a leveling course to even out the pavement surface and a second uniform coarse to provide the necessary thickness. Resurfacing in parking lots generally requires only one overlay.

Except for removing the entire existing lot, and constructing a new lot from the subbase up, resurfacing is the most appearance improving method available.

When preparing pavements for resurfacing, remove and replace specifications can be modified. The hole doesn't need to be as deep and the base course binder asphalt pavement can be used as the surface course. The reason for the modification is that the asphalt pavement overlay will be the surface course for both the lot and the section that was removed and replaced.

Once the binder asphalt pavement has been compacted, then the entire area can be paved with 1.5 inches to two inches of a new wearing surface to cap all repairs.

Once other repairs are made, preparation for resurfacing requires cleaning the surface using either a blower or sweeper, applying a tack coat for adhesive purposes, and then paving per overlay specifications.

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